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10/575,526

12/08/2006

Richard Spitz

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EXAMINER

HSIEH, HSIN YI

ART UNIT

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2811

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DELIVERY MODE

09/13/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/575,526 | Applicant(s) SPITZ ET AL. | |
| | Examiner HSIN-YI HSIEH | Art Unit 2811 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-23 and 26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-23 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

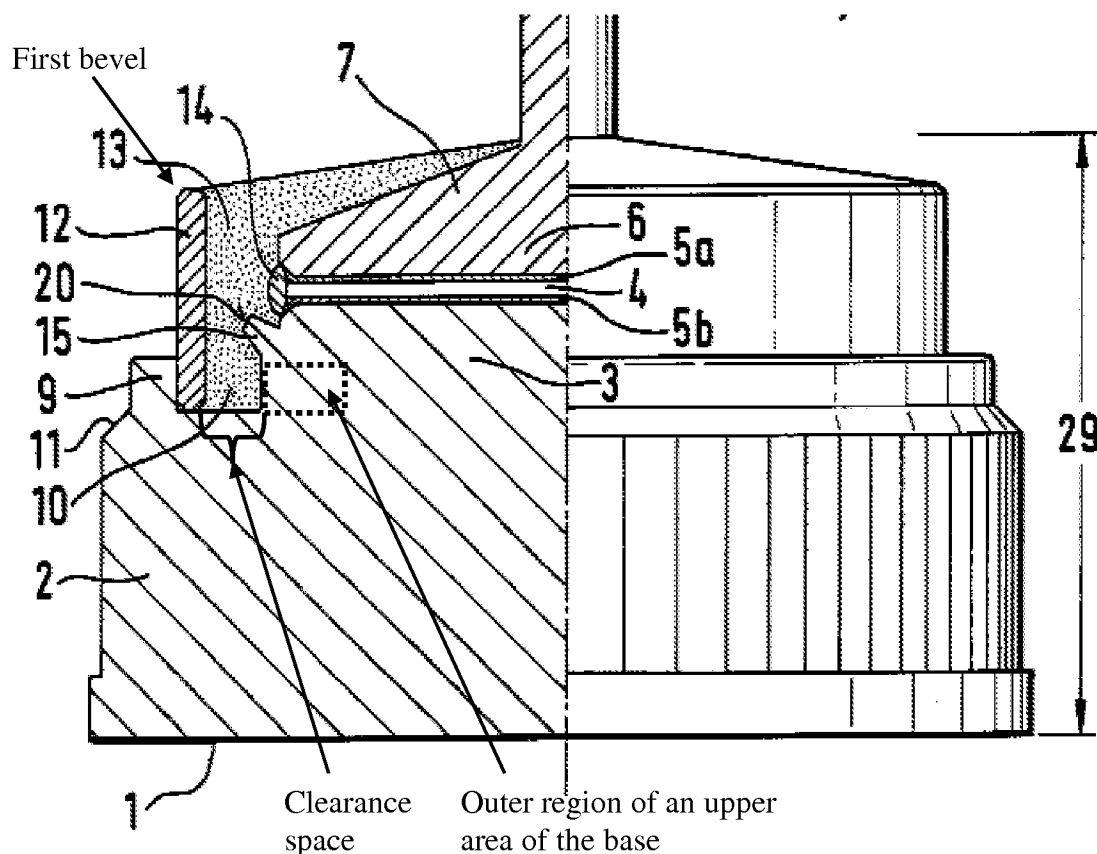
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 15, 16 and 26** are rejected under 35 U.S.C. 102(b) as being anticipated by Spitz et al. (US 6,060,776 A).

3. Regarding **claim 15**, Spitz et al. teach a press-fit diode (rectifier diode 100; Fig. 1, col. 3 lines 15-16), comprising: a head wire (8; Fig. 1, col. 3 lines 21-22); a base (2; Fig. 1, col. 3 line 17); a chip (semiconductor chip 4; Fig. 1, col. 3 lines 19-20) connected via solder layers (solder 5a and 5b; Fig. 1, col. 3 lines 19-21) to the head wire (8) and to the base (2; Fig. 1, col. 3 lines 18-21); at least a first bevel (the bevel at the top outer corner of 12; see Fig. 1 below) located at a top (12 is a top portion of 12, 13, and 2; see Fig. 1 below) of a housing (12, 13 and 2) and a second bevel (press-fit region 11; Fig. 1, col. 3 line 25) located at a bottom (2 is a bottom portion of 12, 13, and 2) of the housing (12, 13 and 2), wherein the first and second bevels (the bevel at the top outer corner of 12 and 11) enable press-fitting of the diode (100; the bevel at the top outer corner of 12 eases the insertion of the diode and 11 is pressed fitted to the rectifier arrangement 36; see Figs. 2 and 3, col. 4 lines 32-54); and a plastic sheathing (protective sheath 12 and a package 13 of casting resin composition; Fig. 1, col. 3 lines 30-32 and 66-67) which includes a sleeve (protective sheath 12; Fig. 1, col. 3 lines 30-32) and is situated at least in an area around the chip (4; the sleeve 12 surrounds the chip 4; see Fig. 1) and forms a mechanical connection

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between the base (2) and the head wire (8; see Fig. 1, the sleeve 12 is mechanically connected to 2 and 8), wherein the base (2) at least partially encloses the plastic sheathing (12 and 13) and forms the housing (12, 13 and 2) with the plastic sheathing (12 and 13), and wherein the base (2) includes at least one undercut (shoulder 15; Fig. 1, col. 3 lines 36-37) which extends into the plastic sheathing (12 and 13; see Fig. 1), and wherein a clearance space (see Fig. 1 below) is provided outside the sleeve (12) between the exterior (the exterior surface) of the sleeve (12) and an outer region of an upper area of the base (2; see Fig. 1 below), the clearance preventing contact between the exterior of the sleeve (the exterior surface of 12) and an outer edge of the upper area of the base (left edge of the outer region of an upper area of the base; see Fig. 1 below).



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A portion of Fig. 1 of Spitz et al. showing the clearance, the first bevel, and the outer area of base

4. Regarding **claim 16**, Spitz et al. also teach the press-fit diode as recited in claim 15, wherein the base (the base 2) is made of at least one of an electrically conductive material and thermally conductive material (solid metal which is electrically conductive and thermally conductive; col. 1 lines 8-10 and 32).

5. Regarding **claim 26**, Spitz et al. also teach the press-fit diode as recited in claim 15, wherein the housing (12, 13 and 2) is made of at least one of an electrically conductive material and thermally conductive material (the base 2 is made of solid metal which is electrically conductive and thermally conductive; col. 1 lines 8-10 and 32).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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8. **Claims 17-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Spitz et al. as applied to claims 16 above.

9. Regarding **claim 17**, Spitz et al. also teach a height of the base (the height of the bulwark 9; Fig. 1, col. 3 line 50) is selected to achieve an adequate clamping of the base (2) and the head wire (8; i.e. the whole construction including 2 and 8, col. 3 lines 40-60).

Spitz et al. do not teach the height of the base is selected to be between 0.5 mm to 0.8 mm.

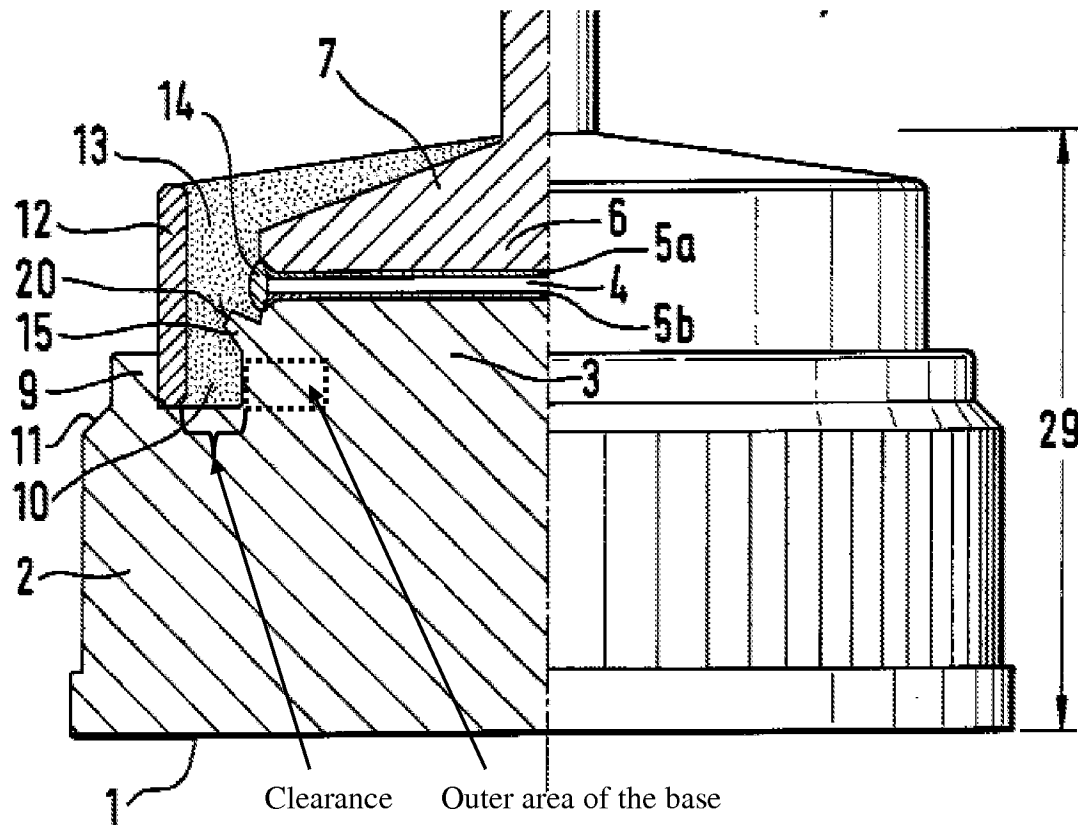
Parameters such as the height of the base in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired structural strength during device fabrication. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to incorporate the height of the base within the range as claimed in order to achieve the desired structural strength.

10. Regarding **claim 18**, Spitz et al. also teach the press-fit diode as recited in claim 17, wherein the first and second bevels (the bevels at the top outer corner of 12 and 11) enable the diode (100) to be pressed into a rectifier (rectifier arrangement 36; see Figs. 2 and 3, col. 4 lines 32-54).

11. Regarding **claim 19**, Spitz et al. also teach the press-fit diode as recited in claim 17, wherein the plastic sheathing (12 and 13) in the area around the chip (surrounding chip 4) is made up of an area (package 13; Fig. 1, col. 3 lines 30-32) filled with a casting compound (casting resin composition; col. 3 lines 66-67).

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12. Regarding **claim 20**, Spitz et al. also teach the press-fit diode as recited in claim 17, wherein the clearance space (the clearance between 12 and 2 filled with 13) has a predetermined depth (see Fig. 1 below).



A portion of Fig. 1 of Spitz et al. showing the clearance and the outer area of base

13. Regarding **claim 21**, Spitz et al. also teach the clearance space (a portion of the trench 10 not occupied by the sheath 12) has a width (the horizontal width).

Spitz et al. do not teach the clearance space has a width which is approximately 0.1 mm in at least one area of the clearance space.

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Parameters such as the width of the clearance space in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired structural strength during device fabrication. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to incorporate the width of the clearance space within the range as claimed in order to achieve the desired structural strength.

14. Regarding **claim 22**, Spitz et al. also teach the press-fit diode as recited in claim 21, wherein the width (the horizontal width) of the clearance space (a portion of the clearance between 12 and 2 filled with 13 from the bottom of bulwark 9 till the top of the bulwark 9) is essentially uniform over the entire depth of the clearance space (see Fig. 1).

15. Regarding **claim 23**, Spitz et al. also teach the press-fit diode as recited in claim 21, wherein the width (the horizontal width) of the clearance space (a portion of the clearance between 12 and 2 filled with 13 from the bottom of bulwark 9 till the top of the shoulder 15) is variable over the depth of the clearance space (see Fig. 1, the horizontal width of the clearance varies at the shoulder 15).

Response to Arguments

16. Applicant's arguments with respect to claim 15 have been considered but are moot in view of the new ground(s) of rejection. The examiner would like to emphasize that the clearance is an open space between two objects. It does not matter whether this open space is filled with chip package material.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HSIN-YI HSIEH whose telephone number is (571)270-3043. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LYNNE GURLEY/

Supervisory Patent Examiner, Art Unit 2811

/H. H./

Examiner, Art Unit 2811

8/31/2011